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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR		ATTORNEY DOCKET NO.
09/318,045	05/25/99	NEUHAUSER	A	0004332-0074

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EXAMINER	
LERNER, M	
ART UNIT	PAPER NUMBER
2641	9

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/318,045	NEUHAUSER ET AL.	
	Examiner	Art Unit	
	Martin Lerner	2641	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 to 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The Specification does not enable one of ordinary skill in the art to know what constitutes a "non-linear function" of the first and second signal values. Certainly, there are many sorts of non-linear functions of two variables (e.g. quadratic or trigonometric functions), but the Specification does not provide any concrete examples of how this might be carried out so as enable one of ordinary skill to make and use the invention. Nor does the Specification describe why one might do this.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 to 3 and 5 to 18 are rejected under 35 U.S.C. 102(b) as being anticipated by *Jensen et al. ('490)*.

Regarding independent claims 1 and 13, *Jensen et al. ('490)* discloses a system and method for decoding code symbols in an audio signal, comprising:

"means for receiving first and second code symbols representing a common message symbol, the first and second code symbols being displaced in time in the audio signal" – code symbols encoded in an analog audio signal are received at input terminal 260 (column 21, lines 46 to 49: Figure 11); in one embodiment, the host processor generates a four state data stream, that is, a data stream in which each data unit can assume one of four distinct data states each representing a unique symbol including two synchronizing symbols termed "E" and "S" and two message information symbols "1" and "0" each of which represents a respective binary state (column 10, lines 40 to 58: Figure 4);

"means for accumulating a first signal value representing the first code symbol and a second signal value representing the second code symbol" – the apparatus accumulates data indicating the presence of code components in each of frequency bins of interest repeatedly for at least a major portion of the predetermined time frame interval in which a code symbol can be found (column 21, lines 23 to 34: Figure 11); circuit 320, under control of control circuit 314, accumulates the various code presence signals from the 4N component detector circuits 290 for a multiple number of reset cycles (column 26, lines 17 to 25: Figure 14);

"means for examining the accumulated first and second signal values to detect the common message symbol" – once DSP 266 has accumulated such data for the relevant time frame, it then determines which of the possible code signals was present in the audio signal (column 21, lines 34 to 45: Figure 11); upon termination of the interval for detection of a given symbol, the code determination logic circuit 320 determines which code symbol was received as that symbol for which the greatest number of components were detected during the interval and outputs a signal indicating the detected code symbol at an output terminal 322 (column 26, lines 25 to 34: Figure 14).

Regarding independent claim 16, *Jensen et al. ('490)* discloses a system for decoding code symbols in an audio signal, comprising:

"an input device for receiving first and second code symbols representing a common message symbol, the first and second code symbols being displaced in time in the audio signal" – code symbols encoded in an analog audio signal are received at input terminal 260 (column 21, lines 46 to 49: Figure 11); in one embodiment, the host processor generates a four state data stream, that is, a data stream in which each data unit can assume one of four distinct data states each representing a unique symbol including two synchronizing symbols termed "E" and "S" and two message information symbols "1" and "0" each of which represents a respective binary state (column 10, lines 40 to 58: Figure 4);

"a digital processor in communication with the input device to receive data therefrom representing the first and second code symbols, the digital processor being programmed to accumulate a first signal value representing the first code symbol and a second signal value representing the second code symbol, the digital processor being further programmed to examine the accumulated first and second signal values to detect the common message symbol" -- the apparatus accumulates data indicating the presence of code components in each of frequency bins of interest repeatedly for at least a major portion of the predetermined time frame interval in which a code symbol can be found (column 21, lines 23 to 34: Figure 11); circuit 320, under control of control circuit 314, accumulates the various code presence signals from the 4N component detector circuits 290 for a multiple number of reset cycles (column 26, lines 17 to 25: Figure 14); once DSP 266 has accumulated such data for the relevant time frame, it then determines which of the possible code signals was present in the audio signal (column 21, lines 34 to 45: Figure 11); upon termination of the interval for detection of a given symbol, the code determination logic circuit 320 determines which code symbol was received as that symbol for which the greatest number of components were detected during the interval and outputs a signal indicating the detected code symbol at an output terminal 322 (column 26, lines 25 to 34: Figure 14).

Regarding claim 2, *Jensen et al. ('490)* discloses that for the purpose of detecting the presence and time of symbols, the sum of the values of SNR(j) ("a third signal value derived from the first and second signal values") for each possible synch symbol and

data symbol is determined; it is determined whether the sum of its corresponding values SNR(j) is greater than any of the others (column 22, lines 16 to 24).

Regarding claim 3, a sum of the values of SNR(j) is a linear combination of the SNR(j) values for each of the code symbols.

Regarding claim 5, *Jensen et al. ('490)* discloses that each of the symbols is representing by a unique set of code frequency components; the symbol S is represented by a first unique group of ten code frequency components f_1 through f_{10}; the symbol E is represented by a second unique group of ten code frequency components f_1 through f_{10}; the symbol 0 is represented by a further unique group of ten code frequency components f_1 through f_{10}; and the symbol 1 is represented by a further unique group of ten code frequency components f_1 through f_{10}; (column 10, line 59 to column 11, line 32: Figure 4); a noise level estimate is carried out around each frequency component bin in which a code component can occur; once the noise level for the bin of interest has been estimated, a signal-to-noise ratio for that bin SNR(j) ("component value" "characteristic of a respective frequency component") is estimated by dividing the energy level B(j) in the bin of interest by the estimated noise level NS(j)(column 20, line 43 to column 21, line 22).

Regarding claim 6, *Jensen et al. ('490)* discloses that symbol detection intervals for the decoders may be established based on the timing of synchronization symbols transmitted with each encoded message and have a predetermined order; the decoders are operative initially to search for the presence of the first anticipated synchronization symbol, that is, the encoded E symbol which is transmitted during the predetermined

period and determine its transmission interval; the decoders search for the presence of code components characterizing the symbol S, and when it is detected, the decoders determine its transmission interval; from this point, the detection of each of the data bits symbols are set (column 26, lines 35 to 59); "S" and "E" are synchronization ("marker") symbols and "1" and "0" are data symbols (column 10, lines 40 to 58: Figure 4).

Regarding claim 7, *Jensen et al. ('490)* discloses a memory 270 for storing the accumulation of detected code symbols (column 21, lines 34 to 42: Figure 11), and DSP 266 decodes a symbol by examining the sum of the values of SNR(j) ("signal values") for each possible synch and data symbol (column 21, lines 46 to 59; column 22, lines 16 to 53: Figure 11).

Regarding claim 8, *Jensen et al. ('490)* discloses that a signal-to-noise ratio for each frequency bin SNR(j) ("signal value") is estimated by dividing the energy level B(j) in the bin of interest by the estimated noise level NS(j)(column 20, line 43 to column 21, line 22); energy level B(j) and noise level NS(j) are "multiple other signal values" which are used to produce signal-to-noise ratios SNR(j) ("signal values").

Regarding claim 9, *Jensen et al. ('490)* discloses that code symbols are repeated during a characteristic time frame interval in which the encoded message has a predetermined duration and order (column 12, lines 28 to 55; column 26, lines 35 to 59: Figure 6).

Regarding claim 10, *Jensen et al. ('490)* discloses that each of the symbols is representing by a unique set of code frequency components; the symbol S is represented by a first unique group of ten code frequency components f_1 through f_{10}; the

symbol E is represented by a second unique group of ten code frequency components f_1 through f_{10}; the symbol 0 is represented by a further unique group of ten code frequency components f_1 through f_{10}; and the symbol 1 is represented by a further unique group of ten code frequency components f_1 through f_{10}; (column 10, line 59 to column 11, line 32: Figure 4); a noise level estimate is carried out around each frequency component bin in which a code component can occur; once the noise level for the bin of interest has been estimated, a signal-to-noise ratio for that bin SNR(j) ("component value" "characteristic of a respective frequency component") is estimated by dividing the energy level B(j) in the bin of interest by the estimated noise level NS(j)(column 20, line 43 to column 21, line 22).

Regarding claims 11, 14 and 17, *Jensen et al. ('490)* discloses that a decoder includes an input terminal for receiving the audio signal which may be a signal picked up from a microphone ("acoustic transducer")(column 19, lines 57 to 67: Figure 11); a digital signal processor 266 is coupled to memory 270 for storing the detected code symbols (column 21, lines 34 to 45: Figure 11).

Regarding claims 12, 15 and 18, *Jensen et al. ('490)* discloses that the system may be enclosed in a housing 382 which is sufficiently small in size to be carried on the person of an audience member participating in an audience estimate survey (column 27, lines 34 to 48; column 28, lines 6 to 13: Figure 17).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Jensen et al. ('490)*.

Jensen et al. ('490) discloses that the accumulation of code components is performed, and then the code components are combined to produce a third value by summing the values of SNR(j). (Column 21, Line 23 to Column 22, Line 53) Summing is a linear function. *Jensen et al. ('490)* does not expressly disclose accumulating to produce a third value by a non-linear function of the first and second values. However, *Jensen et al. ('490)* suggests that stored data samples may be subjected to a weighting function, such as a cosine squared weighting function, a Kaiser-Bessel function, a Gaussian-Poisson function, or a Hanning function for windowing the data. (Column 21, Line 60 to Column 22, Line 4) These are all non-linear weighting functions. Moreover, it is well known that non-linear functions are recognized alternatives to linear functions, and that non-linear weighting may be performed to emphasize some data samples over other data samples. It would have been obvious to one of ordinary skill in the art to perform non-linear weighting of the data samples as suggested by *Jensen et al. ('490)*

as an alternative to simply summing the values of SNR(j) for the purpose of giving more weight to some data samples than to other data samples.

Response to Arguments

Applicants' arguments filed 02 July 2001 have been fully considered but they are not persuasive.

Regarding the rejection of claim 4 under 35 U.S.C. § 112, First Paragraph, Applicants assert that the claim is adequately described in the specification. Applicants state that the Specification provides an example of a non-linear function of first and second signal values to produce a third signal value at Page 27, Lines 16 to 19, where signal values are ranked according to their magnitudes.

This argument is not persuasive. Firstly, ranking signal values according to their magnitudes is not a technique that one of ordinary skill in the art would deem to be a non-linear function. It is not at all clear that ranking signal values according to their magnitudes would produce a third signal value that is a non-linear function of first and second signal values. Secondly, the Specification does not in any way suggest that the disclosed technique of ranking signal values according to their magnitudes is an example of a non-linear function. Instead, the ranking of signal values is disclosed as a distinct embodiment.

Regarding the rejection of independent claims 1, 13 and 16 under 35 U.S.C. § 102(b), Applicants maintain that *Jensen et al. ('490)* fails to anticipate the limitation of these claims that the detection of the common message symbol is based upon an

accumulation of values representing two code symbols that are *displaced in time*. Applicants state that a major advantage of the invention is that representing a common message symbol with different code symbols which are displaced in time is especially useful for overcoming the adverse effects of burst errors.

This is not persuasive because *Jensen et al. ('490)* does accumulate two code symbols that are displaced in time to detect a common message symbol. *Jensen et al. ('490)* states that the decoding apparatus detects the presence of code symbols by accumulating data repeatedly over a predetermined interval. The process is repeated multiple times and component presence is accumulated over a time frame. The DSP stores the detected code symbol in memory together with a time stamp for identifying the time at which the symbol was detected based on an internal clock signal. (Column 21, Lines 23 to 45) Also, *Jensen et al. ('490)* says that the DSP gather and stores samples of the input audio signal repeatedly until a sufficient number has been stored for carrying out the FFT operation. Figure 6 similarly shows that the code symbols are repeated over a number of time frames t_1, t_2, . . . , t_n in the encoder. *Jensen et al. ('490)* discloses that time domain code components are output for each of the code frequency components representing a predetermined duration so that (n) time-domain components are stored for each of the code frequency components for (n) time intervals t_1, through t_n. For example, if the symbol S is to be encoded, during the first time interval t_1, the memory outputs the time-domain components corresponding to that interval, the time domain components are repeatedly output during the next interval t_2, and sequentially for intervals t_3 through t_n. (Column 12, Lines 39 to 55: Figure 6)

Finally, in the embodiment of Figure 14, *Jensen et al. ('490)* teaches that the decoder accumulates the various code presence signals for a multiple number of reset cycles. (Column 26, Lines 17 to 34: Figure 14)

Thus, *Jensen et al. ('490)* does indeed disclose accumulation of two code symbols that are displaced in time to detect a common message symbol. By comparison, Applicants' Specification, Pages 12 to 13 and 20 to 22, identically discloses that code symbols are generated and repeated redundantly to increase survivability.

Furthermore, although *Jensen et al. ('490)* does not expressly state that accumulation of redundant symbols are employed for overcoming the adverse effects of burst errors, this reference generally suggests that the disclosed apparatus and method is designed to reliably recover code symbols in the presence of noise. (Column 1, Lines 5 to 28) Burst errors are simply one type of noise. One of ordinary skill in the art would recognize that repeated, redundant code symbols would implicitly overcome the adverse effects of burst errors, which is a type of noise that is localized over several time frames. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Moreover, overcoming burst errors is not a limitation that is present in any of the independent claims 1, 13 and 16. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Therefore, the rejections of Claim 4 under 35 U.S.C. 112, First Paragraph, of Claims 1 to 3 and 5 to 18 under 35 U.S.C. 102(b) as being anticipated by *Jensen et al. ('490)*, and of Claim 4 under 35 U.S.C. 103(a) as being unpatentable over *Jensen et al. ('490)*, are proper.

Conclusion

THIS ACTION IS MADE FINAL. Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 9:30 AM to 6:00 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (703) 305-6137. The fax phone

numbers for the organization where this application or proceeding is assigned are (703) 305-9508 for regular communications and (703) 305-9508 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

ml

ml
July 23, 2001

William Korzuch
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